REMARKS

The title of the invention has been changed to reflect more accurately the subject matter to which the claims remaining after this amendment are directed. The specification has also been amended to indicate that the subject application is a continuation-in-part of a previously filed and now abandoned application.

Of original claims 1-31, claims 4-7 and 27-30 have been withdrawn and remaining claims 1-3, 8-26 and 31 all stand rejected.

All pending except 22-26 and 31 have been cancelled. With respect to claims 22, 23, 26 and 31, rejected under 35 USC §102(b), the rejection is respectfully traversed in view of the foregoing amendments and the comments which follow.

The invention covered by rejected claims 22, 23, 26 and 31 is a high temperature operation heat exchanger that uses an all-aluminum welded construction which is neither shown nor suggested in the prior art, as will be discussed. A careful examination of the prior art will reveal that the references, without exception, utilize brazed or soldered connections for at least part of the assembly.

Claims 22, 23, 26 and 31 stand rejected under 35 USC §102(b) as anticipated by Haberski, the examiner making particular reference to Fig. 8 of the drawings and column 5, lines 63-66 of the specification.

The above referenced portion of the Haberski specification describes welding peripheral wall elements 32 and 34 together to form a frame and subsequently welding partition wall elements 42 to the frame. After the tube elements 20 are positioned in openings formed by the partition wall elements 42, plate elements 56 and 58 are welded to each other and to the peripheral wall elements 32 and 34. However, the connection of the tube elements 20 to one another and to the adjacent surfaces of the peripheral wall elements 32 and 34 and partition wall elements 42 is effected in "an ultrasonic bath of fluxless zinc solder" in which the welded frame is "entirely immersed or dipped into the bath" (column 6, lines 8-19). Although Haberski discloses that the peripheral wall elements and other elements of the frame may be "secured together in any suitable manner, such as welding, soldering, brazing or the like" (column 1, lines 52-53), connection of the tube elements 20 to the frame is effected with "solder brazing

material or other suitable bonding material" (column 1, lines 59-60). Thus, in Haberski, welding is used for a part of the assembly, but another part of the assembly is clearly limited to a "bonding and sealing" process such as the disclosed hot dip soldering.

It is also clear from the specific construction of the Haberski elements that soldering or brazing is the process utilized to bond and seal the elements 20 to the welded frame. The flat end faces 22 of the tube elements are inserted into the openings 40 in the partition wall elements 42 (Fig. 7) and the significant surface-to-surface contact between the surfaces of the end portions 21 and the surfaces 40 of the partition wall elements are characteristic of a brazed or soldered connection. Furthermore, the welded portions of the Haberski frame are clearly identified, e.g. 38, 66, and 72 (Fig. 3). However, no welds are shown for connecting the tube elements 20 to the frame.

The entire Haberski specification does not mention the metal or metals used in the construction of the heat exchanger and, in particular, there is no disclosure of the use of aluminum.

Applicant has discovered that, in high temperature applications (in excess of 600° F.), such as are encountered in exhaust coolers and air charge coolers, the temperatures are too high for brazed connections which are only safely utilized at temperatures below 500° F.

Claims 22, 23, 26 and 31 also stand rejected under 35 USC §102(b) as anticipated by Berti, the examiner making particular reference to page 1, lines 23-27.

This rejection is also respectfully traversed.

With respect to Berti, it is noted initially that the disclosed heat exchanger is used as an evaporator in a refrigeration system. This is clearly not a high temperature application, but rather one in which conventional brazed or soldered connections of fluid carrying tubes to the respective header plates would typically be used. Even though, as pointed by the examiner, the specification in Berti states that the fluid carrying tubes may have their ends sealed to header places "by welding", an examination of the heat exchanger shows clearly that its construction is of the type in which the tube to header place connections are made by brazing in a solder bath in the manner disclosed by Haberski. The header plates 7 and 17 of Berti have openings in which the ends 16 of the

tubes 10 tightly fit. The holes are "punched out to form respective lips around each said opening" (page 2, lines 23-25).

In the heat exchanger industry, header plates would not be extruded to form lips for a welded construction, but clearly would be formed with the disclosed lips for brazing. If the heat exchanger construction in Berti was intended to be welded, the lips would not only be superfluous, but they would, at least in the embodiment of the lips 7, be detrimental to the formation of a good continuous fillet weld. Furthermore, there is no showing of welds in any of the drawing figures of Berti. Finally, Berti like Haberski is silent as to the metal from which the heat exchanger components are made and, in particular, aluminum is not disclosed.

Although Berti states that the tubes may be connected to the header plates "by welding", one skilled in the art would, when reviewing the entire context of the specification and drawings, conclude that the tubes are intended to be connected to the header plates by brazing, such as in a liquid solder bath in the manner of Haberski.

Independent claims 22 and 26 have been amended to recite the aluminum construction of the tubular modules, the header plates and the welds. It is submitted that such construction is not disclosed in either Haberski or Berti.

Other cited prior art confirms that header plates with lips defining large contact surfaces for the tubes are characteristic of brazed or soldered construction. For example, in 3,245,465 (Young), and referring to Figs. 1-3, the upset or extruded rims 28 and knobs 29 are provided "to enlarge the bonding areas of the tube ends 27 to the header plate 16" (column 3, lines 47-48) "to ensure the requisite capillary action to draw the molden solder into all of the opposed areas of the tubes and the portions of the header plate 16" (column 3, lines 38-40).

Claims 1-3, 8-21 and 24-25 stand rejected under 35 USC §103(a) as unpatentable over Berti or Haberski in view of MacPhee. MacPhee is cited in particular for its disclosure of modules 12 disposed in a housing, the housing defined by a shell 1 with a bottom portion 37 and first fluid openings 2, 3 fluidly connected via partition wall 70, and a cap 51 with chambers 60, 61 in communication with second fluid openings in tube sheet 10 and closing the housing for the purpose of providing a fluid path for the

first fluid. The examiner concludes that it would have been obvious to employ in Berti or Haberski a housing with a partition wall for the purpose of providing a fluid path for the first fluid, as recognized by MacPhee.

Dependent claims 23-25 and 31 are believed to be allowable by virtue of their dependency from either amended claim 22 or amended claim 26. Similarly, new claim 32 which depends from claim 22 is also believed to be allowable. Claims 1-3 and 8-21 have been cancelled.

For all of the foregoing reasons, amended independent claims 22 and 26, and dependent claims 23-25, 31 and 32 are believed to be in condition for allowance. Further favorable action is, therefore, respectfully requested.

Respectfully submitted,

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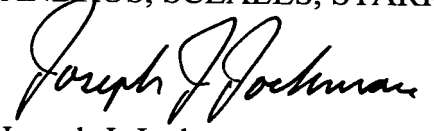

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